

47K

Notice of Allowability

Application No.

10/735,741

Examiner

Dalei Dong

Applicant(s)

LEE ET AL.

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed September 30, 2005.
2. ☒ The allowed claim(s) is/are 7-43.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. The Amendment filed September 30, 2005, has been entered and acknowledged by the Examiner.

Allowable Subject Matter

2. Claims 7-43 are allowed.
3. The following is an examiner's statement of reasons for allowance:

Regarding to independent claim 1, prior art of record taken alone or in combination fails to teach or suggest a method of manufacturing a field emission device, the method of comprising: forming a sacrificial layer on the surface of the substrate structure and on an inner wall of the through hole other than the cathode electrode exposed to the bottom of the through hole; and performing lift-off for removing the sacrificial layer formed on the surface of the gate electrode and on an inner wall of the through hole using an etchant and forming an emitter formed of the resistive material layer and the electron emission material layer formed on the resistive material layer in an inner portion of the through hole, in combination with other claimed features of the present claimed invention.

Regarding to independent claim 14, prior art of record taken alone or in combination fails to teach or suggest a method of manufacturing a field emission device, the method of comprising: forming a sacrificial layer on the surface of the substrate

structure and on an inner wall of the through hole other than the cathode electrode exposed to the bottom of the through hole; and performing lift-off for removing the sacrificial layer formed on the surface of the gate electrode and on an inner wall of the through hole using an etchant, removing the resistive material layer formed on the sacrificial layer and the electron emission material, and forming an emitter formed of the resistive material layer and the electron emission material layer in an inner portion of the through hole, in combination with other claimed features of the present claimed invention.

Regarding to independent claim 24, prior art of record taken alone or in combination fails to teach or suggest a method of manufacturing a field emission device, the method of comprising: forming a sacrificial layer on the surface of the substrate structure and on an inner wall of the through hole other than the cathode electrode exposed to the bottom of the through hole; forming an isolation layer that isolates the sacrificial layer and a resistive material layer formed on the sacrificial layer from each other and does not react to at least one of the sacrificial layer and the resistive material layer; and performing lift-off for removing the sacrificial layer formed on the surface of the gate electrode and on an inner wall of the through hole using an etchant, removing the isolation layer formed on the sacrificial layer, the resistive material layer, and the electron emission material, and forming an emitter formed of the resistive material layer and the electron emission material layer formed on the resistive material layer in an inner portion

of the through hole, in combination with other claimed features of the present claimed invention.

Regarding to independent claim 34, prior art of record taken alone or in combination fails to teach or suggest a method of manufacturing a field emission device, the method of comprising: forming a sacrificial layer on the surface of the substrate structure and on an inner wall of the through hole other than the cathode electrode exposed to the bottom of the through hole; forming an isolation layer that isolates the sacrificial layer and a resistive material layer formed on the sacrificial layer from each other and does not react to at least one of the resistive material layer and the electron emission material layer; and performing lift-off for removing the sacrificial layer formed on the surface of the gate electrode and on an inner wall of the through hole using an etchant, removing the isolation layer formed on the sacrificial layer, the resistive material layer, and the electron emission material, and forming an emitter formed of the resistive material layer and the electron emission material layer formed on the resistive material layer in an inner portion of the through hole, in combination with other claimed features of the present claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of a method of manufacturing a field emission device.

U.S. Patent No. 6,924,158 to Syms.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (571)272-2370. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571)272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



D.D.

December 14, 2005



Joseph Williams
Primary Examiner
Art Unit 2879